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POWERPAK LITE

RetroZone

INSTRUCTION BOOKLET

This official seal is your assurance that Nintendo has not reviewed this product. They might even be unhappy about it being made. Always look for this seal when buying games, even though anyone with a scanner or paint program could easily reproduce it.

Introduction

Thank you for selecting the NES PowerPak Lite. This game requires a qbasic CopyNES system.

OBJECT OF THE CART

The fastest homebrew development system! This RAM cart automatically supports 8 mappers, and different mirroring modes. RAM means it writes fastest and has no write limit. No external programmer or swapping chips is needed. Finally get your game on real hardware with no soldering.

Please read this instruction booklet to ensure proper handling of your new cart, and then save the booklet for future reference or eBay sales.

Please read this instruction booklet to ensure maximum enjoyment of your new game. Be sure to save this booklet for future reference.

1. Precautions

1) This is a high precision cart. It should not be stored in places that are very hot or cold. Never hit or drop it. Never get it wet. Unless you know exactly what you are doing, never take apart.

2) Avoid touching the connectors, do not get them wet or dirty. Doing so may stop the cart from working correctly.

3) PowerPak Lite contacts can be cleaned with rubbing alcohol and cotton balls. Be careful cleaning the case as some solvents or rubbing alcohol can destroy it.

4) Read the instruction booklet thoroughly.

2. Connecting the PowerPak Lite to the NES

PowerPak Lite requires a CopyNES system. It also requires the flash programming mod at:

http://www.tripoint.org/kevtris/Projects/copynes/flash.html

Make sure you have the most recent CopyNES host code version, available at:

http://www.retrousb.com

Currently only the qbasic CopyNES supports the PowerPak Lite. This may change in the future.

3. Mapper Support

INES	Board	MAXCHRROM	MAXCHRRAM	MAXPRGROM	WRAM	Mirror
0	NROM	8KB		32KB		H/V
1	MMC1	128KB	8KB	256KB	8KB	H/V/One
2	UPROM		8KB	256KB		H/V
3	CNROM	32KB		32KB		H/V
7	AXROM		8KB	256KB		One
11	ColorDreams	128KB		128KB		H/V
34	BNROM		8KB	128KB		H/V
66	GNROM	16KB		64KB		H/V

The PowerPak Lite cart automatically selects between 8 supported mappers and chooses the correct mirroring mode using your .nes file.

4. Loading your games and saves

Plug the PowerPak Lite Cart into your CopyNES system and turn the power on.

Choose the RAM Cart option and select the PowerPak Lite.

Then pick your standard .nes file. The mapper and mirroring information will be taken from the iNES header.

PRG is uploaded first, at the maximum speed your CopyNES system will run. If CHR is used it will be uploaded next. Then the mapper is set and the CopyNES will enter play mode. You can hit the reset button on the console and your game will not be lost.

The Write WRAM option can also be used to upload save files to the PowerPak Lite.

There is no battery in the PowerPak Lite so all PRG, CHR, and WRAM data is lost when the power is turned off.

5. Technical Information

The PowerPak Lite cart includes 512KB sram for PRG and WRAM data, 128KB for CHR data, and a Xilinx CPLD. A battery is not included because the CPLD contains mapper configuration data. Keeping power to the CPLD would drain a battery too quickly.

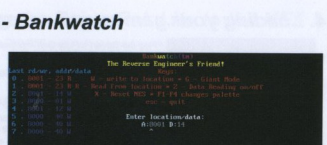
The JTAG port on the CPLD is brought out to a header so you can reprogram the chip for your own uses. Send an email if you need the pinout or the original bin file.

MMC1 is supported but not the expanded board versions like SUROM, SOROM, and SXROM.

The CPLD is not big enough to support the more complex MMC3.

6. CopyNES - Bankwatch

Bankwatch is an amazingly powerful tool for development and troubleshooting. It works somewhat like the memory viewers included with some emulators. Make sure your CopyNES system is turned on when starting the CopyNES host app, then run Bankwatch. Hit "Z" to enable the memory viewing. Character data is displayed using preset colors. F1-F4 change the colors used. Program data in the WRAM and PRG space is also shown. This easily shows the changes that happen at bank switches. Press "G" (capital G) to run code from the address in the address line.



The mapper registers can be directly manipulated like the peek/poke in debuggers. The last 8 read/writes are displayed so you can keep track when doing things like MMC1 register writes.

This is just a small set of the functions Bankwatch can do. Check the copyuse.txt file for further explanation.

7. CopyNES - Microbug

Microbug is another great tool for development. This is a full 6502 emulator running on the NES which allows you to view memory and single step through your program. Breakpoints can also be created at any point in your code. If your game does not start on the NES you can step through from the beginning to find the error. The only limitation is there are no interrupts. You will have to trigger Reset, IRQ, and NMI using the F10-F12 keys. The Scanline (Scnln) counter and Mode display show when the NMI should happen. Now you can make sure your game doesn't take too long in render or vblank time!

Turning on the Banks display with "A" will show which 8KB PRG and 1KB CHR banks. When a bank is swapped it will be marked with a red X. Toggle the Banks display to clear the X.

This is just a small set of the functions Microbug can do. Check the copyuse.txt file for further explanation.